

XLVII.—A Revision of the Old World *Cyrtacanthacrini* (*Orthoptera*, *Acrididæ*).—II. *Genera* *Phyxacra* to Willemsea†. By B. P. UYAROV, F.E.S., Assistant Entomologist, Imperial Bureau of Entomology.

[The figures referred to in this paper will be found in Part I.]

I. Genus *PHYXACRA*, Karny.

1907. *Phyxacra*, Karny, Sitz. Akad. Wiss. Wien, Bd. cxvi. Abt. 1, p. 309.

Karny included in this genus, besides the genotype, *Coptacra variolosa* of Krauss, also *Ph. cœrulans*, Karny. Later on (1914) Rehn described the third species, *Ph. nigrispinis*, which, however, judging by the description, is not a *Phyxacra*, but an *Acridoderes*. On the other hand, *Locusta renkensis*, Karny, of which I have studied the type, is undoubtedly congeneric with *variolosa* and *cœrulans*, while *variolosa* itself, as well as *Cyrtacanthacris scrobiculatus*, Karsch, are conspecific with *Caloptenus strenuus*, Walk. Thus, the number of the known species of *Phyxacra* is three: *strenua*, *cœrulans*, and *renkensis*; as all of them are as yet very insufficiently known and represented by very few specimens, nothing definite can be said as to their exact relationship, and the following key is necessarily very incomplete:—

Key to the Species.

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|--|------------------------------|
| 1 (2). Fastigium of the vertex not punctured. Pronotum narrowed anteriorly, but without any constriction; its posterior fourth reddish brown, with blackish dots and streaks; hind angle straight, not rounded. Anal field of elytra with an indefinite reddish design. (Sudan.) . . . | 1. <i>renkensis</i> (Karny). |
| 2 (1). Fastigium of the vertex coarsely punctured, at least towards its front margin. | |
| 3 (4). Pronotum without a constriction in the prozona; its front margin not touching the eyes. Wings hyaline. (Senegal, Gold Coast.) | 2. <i>strenua</i> (Walk.). |
| 4 (3). Pronotum thick, distinctly constricted in the prozona; its front margin touching the eyes. Wings bluish at the base. (Northern Uganda.) | 3. <i>cœrulans</i> , Karny. |

† Part I., Ann. & Mag. Nat. Hist. (9) xi. p. 130 (1923).

1. *Phyxacra renkensis* (Karny).

**1907. *L[ocusta] renkensis*, Karny, Sitz. Akad. Wiss. Wien, Bd. cxvi. Abt. 1, p. 306, no. 58.

1910. *C[yrtacanthacris] renkensis*, Kirby, Cat. iii. p. 454. no. 69.

It is very strange that Karny did not recognise that this species belongs also to the genus *Phyxacra* described by himself in the same paper, seeing that the venation of the elytra and the shape of the head and sternum show the closest relationship to *variolosa* and *cærulans*. As the type is the only specimen known and in very bad condition, having obviously been kept some time in alcohol and having lost both its hind legs, nothing can be said as to the variability of species.

Geographical distribution. The type is from Renk, Sudan.

2. *Phyxacra strenua* (Walk.). (Figs. 4 C, 4 D, 5 a.)

**1870. *Caloptenus strenuus*, Walk. Cat. iv. p. 699. no. 49.

**1877. *Coptacra variolosa*, Krauss, Sitz. Akad. Wiss. Wien, Bd. lxxvi. p. 33. no. 1.

1893. *Cyrtacanthacris scrobiculatus*, Karsch, Berl. Ent. Ztschr. xxxviii. p. 89. no. 49.

1910. *C[yrtacanthacris] scrobiculatus*, Kirby, Cat. iii. p. 453. no. 67.

1910. *P[hyxacra] variolosa*, Kirby, l. c. p. 469. no. 1.

1910. *A[cridoderes] strenuus*, Kirby, l. c. p. 470. no. 1.

The type of *variolosa* differs from that of *strenua* in its slightly larger size and in its paler coloration, but I do not hesitate to regard them as being conspecific. One female in the British Museum from Liberia perfectly agrees in all morphological characters with the type of *variolosa*, but is of a darker colour, with distinct oblique brownish fasciæ on the elytra. It is very likely that *Acridium cribrifrons*, Walk. (Cat. v., Suppl. p. 60), represents a male of this species, as its type is from the same locality and collector as that of *strenua*, but the type of *cribrifrons* is lost and nothing definite can be said from the description.

Geographical distribution. The type of *strenua* is from Gambia, that of *variolosa* from Senegal. In the British Museum there are specimens from Liberia and Yapi, N. Territories, Gold Coast; Karsch described his *scrobiculatus* from Bismarckburg, Togo, so that the species seems to be confined to West Africa.

3. *Phyxacra cærulans*, Karny.

**1907. *P[hyxacra] cærulans*, Karny, Sitz. Akad. Wiss. Wien, Bd. cxvi. Abt. 1, p. 308. no. 61.

1910. *P[hyxacra] cæruleus* (sic!), Kirby, Cat. iii. p. 469. no. 2.

This is a more robust species than *strenua*, differing from

the latter also in the shape of the pronotum and in the coloration of the hind wings, but it is not known whether these characters are constant.

Geographical distribution. Besides the type, which is from Gondokoro, N. Uganda, only one specimen (a male) is known to me; it belongs to Prof. R. Ebner, of Vienna, and was taken by him at Talodi, Anglo-Egyptian Sudan.

II. GENUS *ACRIDODERES*, Bol.

1889. *Acridoderes*, Bolivar, Journ. Scien. Mat. Phys. e Natur. Acad. Lisboa, i. p. 163.

As I have the genotype of *Acridoderes* before me, I am in a position to define the differences between this genus and *Phyxacra* (see the key to genera, Part I., p. 138) and also to determine what other species should be referred to it. Amongst the species described under *Acridoderes* four belong to other genera, as follows: *A. punctatus*, Kirby, and *tectiferus*, Karsch, to *Rhytidacris*, Uv. (p. 483); *A. amethystinus*, Bol., to *Pachynotacris*, Uv. (p. 480); and *A. lavigatus*, Bol., to *Anacridoderes*, Uv. (p. 477); while *A. prasinus*, Karsch, unknown to me save by description, probably belongs to an undescribed genus. *Caloptenus strenuus*, Walk., included in the genus *Acridoderes* by Kirby, belongs to *Phyxacra* (see p. 474). Thus, only the genotype remains in the genus, but I do not hesitate to refer to it two more species originally described under other generic names, viz., *Cyrtacanthacris validiceps*, Karsch, and *Phyxacra nigrispinis*, Rehn. As I have seen only one of the three known species, the following key is based on the original descriptions and should be considered as preliminary:—

Key to the Species.

- 1 (4). Elytra extending beyond the hind knees in both sexes.
- 2 (3). Larger. Transverse sulci of the pronotum fine. Elytra extending well beyond the hind knees, even in the female. General coloration darker, with numerous blackish dots on the head and pronotum; hind femora with two blackish fasciæ on the upper side; hind tibiæ with the extreme base shining black, then with a narrow, indefinite, pale ring, elsewhere brownish violaceous above and pale beneath; tibial spines yellowish with the tips and the whole of the hind surface black. (Angola; Mashonaland.) 1. *crassus*, Bol.
- 3 (2). Smaller. Transverse sulci of the pronotum deep. Elytra in the female only slightly

extending beyond the hind knees. General coloration paler, without blackish markings; hind tibiae with the basal part blackish, the spines entirely black. (Ruwenzori.)

- 4 (1). Elytra in the female just reaching the hind knees, in the male a little longer. Coloration reddish grey, without black dots. Hind wings bluish at the base. Hind tibiae pale on the inner side, bluish on the upper side, with pale black-tipped spines. (Central Africa.)

2. *nigrispinis* (Rehn).

[(Karsch).

3. *validiceps*

1. *Acridoderes crassus*, Bol. (Figs. 1A, 2a, 4A, 4B.)

**1889. *Acridoderes crassus*, Bolivar, Journ. Acad. Scien. Lisboa, i. p. 163. no. 155.

1910. *A[crideres] crassus*, Kirby, Cat. iii. p. 470. no. 2.

Geographical distribution. The types are from Kakonda (Caconda) and Kwango in Angola; I have seen three specimens perfectly identical with the types from Salisbury, Mashonaland (B.M. and O.M.).

2. *Acridoderes nigrispinis* (Rehn).

1914. *Phyxacra nigrispinis*, Rehn, Wiss. Ergebn. Deutsch. Z.-Afr. Exped. Bd. v. Lief. 1, p. 115.

The description of this species leaves no doubt that it belongs not to *Phyxacra* but to *Acridoderes*. It seems to be fairly distinct from *A. crassus*, though the colour-characters given by Rehn are not quite reliable owing to the preservation of the unique type in spirit.

Geographical distribution. Described from the foot of Mt. Ruwenzori.

3. *Acridoderes validiceps* (Karsch).

1896. *Cyrtacanthacris validiceps*, Karsch, Stett. Ent. Ztg. lviii. p. 296. no. 59.

The original description enables me to conclude that the species belongs to *Acridoderes* and is sufficiently distinct from the two others known. It is omitted from Kirby's Catalogue altogether.

Geographical distribution. Kabebe, Central Africa (*Karsch*, l. c.).

III. Genus ANACRIDODERES, nov.

Though I have not been able to study the type of *Acridoderes levigatus*, Bol., I have not the slightest doubt that I am correct in referring three insects from the Transvaal to

that species, and I do not find it possible to retain them in the genus *Acridoderes*, as the shape of fastigium and of the pronotum, as well as the reticulation of the elytra, which is somewhat abnormal for a member of the group *Acridoderi*, are all characters of generic value, and so striking that a detailed description of the genus may be omitted.

1. *Anacridoderes laevigatus* (Bol.). (Fig. 5 b.)

1911. *Acridoderes laevigatus*, Bolivar, Ann. Soc. Ent. Belg. lv. p. 303. no. 9.

Owing to a slip, the species is called *An. crassus* in the explanation of the fig. 5 (Part I., p. 139).

Geographical distribution. Katanga, Belgian Congo (Bol., l. c.); Pretoria and Johannesburg, Transvaal (B.M., 3 ♀ ♀).

IV. GENUS CONGOA, Bol.

1911. *Congoa*, Bolivar, Ann. Soc. Ent. Belg. lv. p. 303.

The genus undoubtedly belongs to the group of *Acridoderi*, as the shape of the head and elytra (which are, though abbreviated, distinctly obliquely truncate apically) shows, and it is quite distinct from any other genus of the group. Only one species is known.

1. *Congoa katangæ*, Bol.

*1911. *Congoa katangæ*, Bolivar, l. c. p. 304. no. 10.

The type, which is the only specimen known, is charcoal-black all over (except on the sides of the abdomen, which are somewhat brownish), and there is no reason to think, as Bolivar does, that this coloration, unusual in Orthoptera though it is, is not natural and due to the bad preservation of the specimen.

Geographical distribution. Katanga, Congo (Mus. du Congo Belge).

V. GENUS PACHYACRIS, nov.

This new genus forms a kind of link between the true *Acridoderi* (i. e., the genera *Acridoderes*, *Anacridoderes*, *Phyxacra*, and *Congoa*) and the *Valanga* group of genera, as it agrees with the latter group in the shape of the fastigium, frontal ridge, and apex of elytra, while the reticulation of the apical half of the elytra is very characteristic for *Acridoderi* and *Coptacrae*.

Two species are known in this genus, both from the Oriental region.

Key to the Species.

- 1 (2). Fastigium of the vertex distinctly impressed, less sloping. Frontal ridge not at all dilated above the ocellum. Head and pronotum above with a pale median fascia prolonged into the anal field of elytra. Elytra almost unicolorous brownish, with very small and indistinct, scattered, darker spots. Wings infumate throughout, with the base pale violaceous. (Ceylon.) 1. *violascens* (Walk.).
- 2 (1). Fastigium of the vertex almost flat, distinctly sloping. Frontal ridge above the ocellum slightly dilated. Coloration brownish, with more numerous darker spots on the elytra, forming more or less distinct narrow oblique fasciæ in the apical part. Wings infumate throughout, with the base rosy. (India, China.) 2. *vinosa* (Walk.).

1. *Pachyacris violascens* (Walk.).

**1870. *Acridium violascens*, Walker, Cat. iii. p. 587. no. 38.

1910. *C[yracanthacris] violascens*, Kirby, Cat. iii. p. 452. no. 53.

1914. *Orthacanthacris violascens*, Kirby, Fauna Br. Ind., Acr. p. 229. no. 276.

The coloration, as described in the key, seems to be fairly constant in the series before me. In one specimen from Mysore, S. India, there are, however, fairly well-pronounced dark spots on the elytra, forming irregular oblique fasciæ, like those in *vinosa*; at the same time the upper median fascia on the head and pronotum is well developed, and the shape of the frontal ridge and fastigium is quite typical for *violascens*. In case these characters prove to be present in all specimens from the Indian mainland, they must be separated as a distinct geographical form.

Geographical distribution. This species seems to be very common in Ceylon, whence came Walker's types; there is only one specimen known to me from the mainland (Mysore), which may represent a distinct subspecies (see above). I have seen also one specimen from the Madrid Museum, labelled "Usambara," which is doubtless incorrect.

2. *Pachyacris vinosa* (Walk.). (Fig. 6 a.)

**1870. *Acridium vinosum*, Walk. Cat. iii. p. 588. no. 40.

**1900. *Cyrtacanthacris wingatei*, Kirby, Ann. & Mag. Nat. Hist. (7) vi. p. 381.

1910. *C[yracanthacris] vinosa*, Kirby, Cat. iii. p. 452. no. 54.

1910. *C[yracanthacris] wingatei*, Kirby, l. c. no. 55.

The type of *C. wingatei* is much smaller and much darker

than the typical Indian *vinosa*, but another specimen† from the same locality as *wingatei* is much nearer to *vinosa* in its dimensions and coloration, which prevent me from regarding *wingatei* as a northern subspecies of *vinosa*. Specimens from Burma are also somewhat smaller than those from India, but of the same coloration.

Geographical distribution. The type of *vinosa* is from North Bengal. Other specimens in the British Museum are from Mohaupar and Pakur, Bengal; Maymyo, Burma; Aijal, Lushai Hills, Assam; Yang-tse-kiang, China.

VI. Genus *PACHYNOTACRIS*, nov.

Face rugulose. Frontal ridge in profile straight, distinctly reclinate, prominent, and somewhat dilated between the antennæ, flat, punctured, impressed below the ocellum, lowered and disappearing before the clypeus. Antennæ reaching beyond the base of the hind femora. Fastigium of the vertex strongly sloping, forming a broad curve with the frontal ridge, slightly impressed, not marginate. Distance between the eyes slightly broader than the frontal ridge between the antennæ and distinctly narrower than the horizontal diameter of an eye. Eyes strongly prominent sideways; their height less than twice the horizontal diameter, which is subequal to the height of the subocular sulcus. Pronotum with the prozona perfectly rounded and swollen on the lateral lobes; the metazona almost flat; median keel fine, linear, interrupted by feeble transverse sulci; the whole surface rugulose; hind angle about 90° , rounded. Prosternal spine straight, feebly narrowed apically, almost cylindrical. Elytra slightly longer than the abdomen, broad, subcoriaceous, coarsely and irregularly reticulated; the apex rounded. Hind femora short, basally dilated, with all keels distinctly serrate. Hind tibiæ thick, armed with eight outer and nine inner stout spines. Male cerci straight, compressed, narrowly triangular. Male subgenital plate conical, somewhat recurved. Valvæ of the female ovipositor elongated, without basal teeth.

Genotype: *Acridoderes amethystinus*, Bol.

This is a very peculiar genus, easily separated from any other by the above characters. Only one species is known.

† Recorded by Kirby (*l. c.*) as *Cyrt. succincta*, L. (!).

1. *Pachynotacris amethystina* (Bol.).

**1908. *Acridoderes amethystinus*, I. Bolivar, Mem. Soc. Ent. Belg. xvi. p. 114, no. 120.

Bolivar's type, which I have studied, is badly discoloured. One of two specimens in the British Museum, a female, perfectly identical with Bolivar's species in all the morphological characters, is very vividly coloured, being black and sulphur-yellow; the elytra are black basally, gradually merging into dark violet towards the apex, with a sharply defined sulphurous stripe in the anal field; wings vinous, but not amethyst as in the type, which is undoubtedly discoloured; hind femora black all over except both upper areas and the genicular lobes, which are yellow; hind tibiae black all over, including the spines.

Geographical distribution. Stanley Falls (Belgian M.; Bolivar's type); Entebbe, Uganda, 1 ♂, 1 ♀ (B.M.).

VII. Genus BRYOPHYMA, nov.

Frontal ridge in profile distinctly convex, forming a wide curve with the fastigium. Fastigium of the vertex strongly sloping, somewhat convex, its margins not at all or scarcely raised, distant behind. Distance between the eyes distinctly broader than the base of the frontal ridge; the height of an eye in ♀ distinctly less, in the ♂ not more, than the height of the subocular sulcus. Pronotum distinctly compressed laterally, very feebly constricted in the prozona, coarsely punctured and rugulose; its front margin rounded, slightly prominent in the middle; hind angle about 90°; median keel in prozona tectiform, deeply cut by transverse sulci, in prozona sharp, lowered before the hind margin. Elytra transparent throughout, with not dense reticulation; their apex bent backwards, moderately narrowed, obliquely truncate. Wings faintly coloured. Hind femora distinctly widened basally; supero-external area granulated; the upper keel of the externo-median area denticulate. Hind tibiae with 8-9 outer and 10-11 inner spines. Male cerci elongato-triangular, compressed, with the apex incurved. Male subgenital plate short, conical.

Genotype: *Cyrtacanthacris debilis*, Karsch.

Two known species may be included in this genus, namely, *debilis*, Karsch, and *sigillata*, Bol., and I regard them as but geographical races of the same species.

1. *Bryophyma debilis* (Karsch). (Fig. 3a.)

Though the material at my disposal is rather scanty,

I believe I am right in splitting the species into three geographical races, one of which is new.

Key to Subspecies.

- 1 (2). Pronotum unicolorous. Hind tibiæ on the upper side violaceous. Median keel of pronotum feebly raised throughout, in profile scarcely convex. Size smaller. (East Africa.) 1*a. debilis* (Karsch).
- 2 (1). Pronotum not unicolorous; its median keel distinctly raised, in profile strongly convex.
- 3 (4). Pronotum more compressed laterally, sanguineous above, with the lateral lobes green. Transverse fasciæ of hind femora sanguineous or violaceous. Hind tibiæ reddish. Elytra without any trace of fasciæ. (Uganda.) 1*b. picta*, subsp. n.
- 4 (3). Pronotum thicker, with round black or violaceous-black dots on the upper surface. Transverse fasciæ of hind femora black. Hind tibia greyish green. Elytra with very faint and irregular oblique fasciæ. (Inner Congo; Mashonaland.).. 1*c. sigillata* (Bol.).

1*a. Bryophyma debilis debilis* (Karsch).

1896. *Cyrtacanthacris debilis*, Karsch, Stett. Ent. Ztg. lvii. p. 300. no. 63.

I have only a single specimen (S.M.) before me which agrees perfectly well with the original description; as it is from Punda Melia, near Nairobi, Brit. E. Africa, and the original type was from Zanzibar, I take it for the typical subspecies, distributed over the country eastwards from the lakes. Unfortunately, the specimen is discoloured by preservation in spirit.

1*b. Bryophyma debilis picta*, subsp. n.

The specimens from Western Uganda are very distinctly coloured and should be regarded as an independent subspecies. Dimensions of the type (♂) are as follows: body 39; pronotum 9; elytra 36; hind femur 20 mm.

Geographical distribution. Described from 4 ♂♂ and 3 ♀♀ from the following localities: Entebbe, Uganda, 2 ♂♂, 1 ♀ (one male being the holotype); Kampala, Uganda, 1 ♂; Tororo, Uganda, 1 ♂, 1 ♀ (all in B.M.); Uganda occident., prov. Toro, environs de Fort Portal (M.M.).

I c. Bryophyma debilis sigillata (Bol.).

*1908. *Acridium sigillatum*, I. Bolivar, Mem. Soc. Ent. Belg. xvi. p. 111. no. 111.

Specimens from Mashonaland are somewhat more slender and smaller than the type from the Congo, the typical black dots on the pronotum being also not always well developed, so that they may be regarded as transitional to *B. debilis picta*, but still they are more like those of *sigillata*.

Geographical distribution. Luluabourg (M.M.; type of *A. sigillatum*, Bol.); Salisbury, Mashonaland (B.M.; O.M.); S. Rhodesia (C.M.).

VIII. Genus RHYTIDACRIS, nov.

Frontal ridge in profile feebly convex, distinctly inclined, forming a very wide curve with the fastigium. The latter very strongly sloping, distinctly impressed, hexagonal, but not separated from the frontal ridge, its margins raised, convergent behind. Distance between the eyes narrower, or scarcely broader than the base of the frontal ridge, which is narrowed below the ocellum. The height of an eye in both sexes more than the height of the subocular sulcus. Pronotum compressed laterally, somewhat narrowed but scarcely constricted in the prozona, very coarsely punctured or callously rugose; its front margin rounded or slightly prominent; hind angle not less than 90° , more or less rounded; median keel more or less raised, convex in profile. Elytra in the basal half subcoriaceous, with the reticulation moderately dense; strongly narrowed towards the apex, which is lancet-shaped and bent backwards. Wings slightly infumated apically, colourless elsewhere. Hind femora basally strongly dilated and thickened; the supero-external area granulated; supero-median and supero-external keels strongly denticulate. Hind tib.æ with 7–8 outer and 9–10 inner spines.

The shape of the frontal ridge which is somewhat dilated between the antennæ, the structure of the hind femora, and the peculiar ocellar fasciæ on the elytra indicate a relationship to the group *Acridoderi*, and particularly to the genus *Phyxacra*, from which *Rhytidacris* differs, however, in many important characters, as is evident from the key to genera. In fact, it is a connecting-link between the *Acridoderi* and the *Anacridium* group of genera.

One species, besides the genotype, is known.

Key to Species.

- 1 (2). Fastigium of the vertex longer than broad (even in the female), acutely angulate or very narrowly truncate behind. Pronotum distinctly compressed laterally, with very coarse impressions and callous rugosities, especially noticeable in the metazona, where they are longitudinal; its median keel strongly arched. (W. & C. Africa.) 1. *tectifera* (Karsch).
 2 (1). Fastigium of the vertex not longer than broad (even in the male), truncate behind. Pronotum thick, coarsely punctured, with rugosities in the prozona only; its median keel low. (S.E. Africa.) 2. *punctata* (Kirby).

1. *Rhytidacris tectifera* (Karsch). (Fig. 6 b.)

1896. *Cyrtacanthacris tectiferus*, Karsch, Stett. Ent. Ztg. lvii. p. 299. no. 62, fig. 24.

Geographical distribution. Yapi, N. Territories, Gold Coast; Old Calabar (B.M.); Kamerun (M.M.); Kassongo to Stanley Falls (M.M.); Popocabacca (Bl. M.); Kondove to Karonga, Nyasaland (B.M.); Zomba (B.M.).

The specimen from Cameroons is very dark brown on the upper side, while the lateral lobes of the pronotum and mesopleuræ are pale, but it does not differ in structural characters from other specimens, and I take it to be just a colour aberration.

2. *Rhytidacris punctata* (Kirby).

**1902. *Acridoderes punctatus*, Kirby, Trans. Ent. Soc. London, p. 239. no. 108c.

Kirby says that his type is a female, but it is obvious even from his description of the genitalia that it is a male, as the study of the type shows.

Geographical distribution. Rustenburg, Transvaal (Kirby's type; B.M.); Bultfontein, Pretoria distr. (B.M.); Durban (B.M.); Zoutpansberg, Transvaal (M.M.).

IX. Genus *SCHISTOCERCA*, Stål.

This is an essentially New World genus, or rather group of genera, which is represented in the Central and South America by a large number of species, requiring a thorough revision, as their systematics and synonymy are in a chaotic state. As this paper, however, is restricted to the Old World representatives of the group, we have to deal with a single species only, which is also the type of the genus.

1. *Schistocerca gregaria* (Forsk.).

1775. *Gryllus gregarius*, Forskål, Descr. animalium, quae in itinere orientali observavit, p. 81.

1804. *Acridium peregrinum*, Olivier, Voyage dans l'empire Othoman, etc. iv. p. 388, footnote.

1910. ||*Schistocerca tatarica*, Kirby, Syn. Cat. Orth. iii. p. 459. no. 46 (nec Linné!).

The correct synonymy of this species was established by H. Krauss in 1907 (Denkschr. mat.-nat. Kl. K. Akad. Wiss. Wien, lxxi. p. 12 of separate copy), but Kirby overlooked Krauss's paper, as well as that of Forskål, and thus missed the name given to the insect in question by the latter author, which has priority over that of Olivier. Moreover, Kirby added to the confusion by ascribing the name *Gryllus tataricus* of Linné to this insect, which clearly contradicts the original description of the Linnean species, as is shown in my notes on the latter (see below).

All further synonyms are given by Kirby correctly, including *Acridium subsellatum*, Walker, the type of which is a perfectly typical example of the species, though reputed to come from South America.

The interrelations of this species and the South American *S. paranensis*, Burm., have been studied by me on a fairly large series of specimens, and the conclusion reached is that they may be separated by a good number of morphological characters, though I am not yet in the position to say definitely whether those characters are of specific value, or whether the two insects should be regarded as but subspecies of one species.

S. gregaria is fairly constant in its specific characters, but I managed to find amongst the collections studied by me a number of specimens which are all strikingly aberrant from the typical form in the less constricted pronotum, with the median keel more raised and the surface more rugose, as well as in the dull greyish coloration, with distinct dark and pale fasciæ on the pronotum. This form agrees perfectly well with the description of *Acridium flaviventre*, Burm., and I believe it to represent the solitary phase of the species, and I call it, accordingly, *S. gregaria*, ph. *flaviventris* †.

Geographical distribution. *S. gregaria* occurs over practically the whole of Africa (with the possible exception of the belt of equatorial forests), and also in S.W. Asia, reaching as far north as Transcaspia and as far east as Kashmir (B.M.), as

† For a detailed account of the matter, as well as of the geographical distribution, variability, and bionomics of *S. gregaria*, see my paper in Bull. Entom. Res. xiv. pt. 1, 1923 (in press).

well as on some of the Atlantic Islands—Cape Verde, Grand Canary, Ascension (B.M.). The existing records of its occurrence also in South America are considered by me to be erroneous and based on a confusion with *S. paranensis*.

X. Genus RHADINACRIS, nov.

Small and slender. Antennæ fairly thick, somewhat compressed, extending in both sexes well beyond the hind margin of the pronotum. Frontal ridge strongly reclinate, in profile straight, forming a very distinct, though rounded, angle with the fastigium. The fastigium slightly sloping, distinctly longer than broad, somewhat impressed. Eyes large, strongly prominent; their length equal to the subocular height, or even exceeding it, and more than a half of the horizontal diameter; the distance between the eyes less than their horizontal diameter, and subequal to the width of the frontal ridge between the antennæ. Pronotum compressed laterally, and distinctly constricted in the prozona; its surface rugulose; the median keel low, but fairly thick, smooth, and very deeply cut by the transverse sulci. Prosternal spine thick, somewhat inflated apically, straight, or very slightly inclined backwards. Elytra very narrow, with sparse reticulation. Wings narrow, hyaline. Hind femora narrow, but rather thick, with all keels remotely and obtusely serrate. Hind tibiæ with 8 outer and 10–11 inner spines. Male cerci compressed, broad, triangular.

This is certainly a very aberrant genus, but its relation to *Schistocerca*, suggested by the specific name, owing to the shape of the male cerci, is not very close if other characters are taken into consideration. The genus is monotypic.

1. *Rhadinacris schistocercoides* (Brancs.). (Fig. 5 c.)

1893. *Acridium schistocercoides*, Brancsik, Jahresh. Ver. Trens. Com. xv.–xvi. p. 122, pl. xii. fig. 2 a–c.

*1907. *Acridium schistocercoides*, Finot, *l. c.* p. 310.

*1916. *Cyrtacanthacris schistocercoides*, J. Carl, Rev. Suisse Zool. vol. xxiv. no. 6, p. 490.

The general coloration of this species is somewhat variable, as is mentioned by Finot and, especially, by J. Carl (*ll. c.*).

Geographical distribution. Madagascar.

XI. Genus ANACRIDIDIUM, nov.

Frontal ridge in profile vertical, or practically so, slightly dilated above the ocellum, but narrowed again at the

fastigium; its surface impressed below the ocellum, flat above it; margins callous. Fastigium of vertex slightly sloping, somewhat impressed along the middle; its margins raised, convergent behind, or nearly so. Eyes large, strongly prominent, about twice as high as long; their height subequal to the subocular distance; distance between eyes distinctly less than the length of an eye. Pronotum laterally compressed and more or less constricted in the prozona; its surface rugulosely punctured, and bearing small scattered callous tubercles; median keel fairly thick, tectiform, convex in profile, deeply cut by transverse sulci. Prosternal spine cylindrical or slightly compressed laterally, straight, or feebly bent forwards, with the apex rounded. Elytra long and fairly narrow, with the apex attenuate and bent backwards (fig. 6 c). Wings with the whole basal part, or with but a submedian fascia, infumate. Male cerci cylindrical and narrow, almost filiform, at least as long as the anal plate, curved. Male subgenital plate trilobate apically.

Though the genotype (*A. ægyptium*) somewhat differs from the two other known species in the shape of the pronotum, which in it is less constricted in the prozona and more angulate behind, there is no reason to split the genus, which is quite a natural one.

Key to the Species.

- 1 (2). Pronotum distinctly angulated behind. Prosternal spine perfectly straight and vertical, not compressed laterally, with the apex obtuse. Male cerci shorter, neither reaching the apices of the lateral lobes of subgenital plate nor touching each other apically. (Mediterranean countries.) 1. *ægyptium* (L.).
- 2 (1). Pronotum distinctly rounded behind. Prosternal spine slightly inclined backwards, compressed laterally, with the apex subacuminate. Male cerci longer, reaching to the apices of the side-lobes of subgenital plate, and touching each other apically, or even with the apices crossed.
- 3 (4). The fascia of the hind wings, however broad, never touching the hind margin; base of the wings hyaline, or rosy, or violaceous. (Africa, south of Sahara.) 2. *mæstum* (Serv.).
- a* (b). General coloration darker. The wing-fascia very broad, shining black, with the outer margin sharply defined; a longitudinal series of black spots between the anal and axillar vein, and several more black confluent spots near the apex. (South and equatorial Africa.) 2 *a*. subsp. *mæstum* [(Serv.).]

- b* (a). General coloration paler. The wing-fascia narrow and short, more or less obsolete, imperfectly margined; the spots in the post-anal area and in the apical part less numerous, smaller, and paler. (Cape Verde Islands, Sudan, Abyssinia, Aden, Sokotra.) *[rhodon* (Walk.).
 2 *b*. subsp. *melanor-*
 4 (3). The fascia of the hind wings is along the hind margin, not extending forward beyond the middle of the wing; base of the wing yellow. (S. India, Ceylon.).. 3. *flavescens* (F.).

1. *Anacridium ægyptium* (L.). (Figs. 2 *b*, 3 *b*.)

1764. *Gryllus Locusta ægyptius*, Linnaeus, Mus. Ludov. Ulr. p. 131.

1910. *O[rthacanthacris] ægyptia*, Kirby, Cat. p. 444. no. 6.

**1870. *Acridium indecisum*, Walker, Cat. iii. p. 585. no. 32.

1870. *Acridium albidiferum*, Walker, Cat. iv. p. 627.

Though the type of *A. albidiferum* does not exist, the description of this species and the locality (Sinai) leave no doubt that it is conspecific with *ægyptium*. As for *A. indecisum*, the type (a female, not male, as Walker indicated in the description) and another male specimen, named by Walker as *A. tataricum* (= *ægyptium*; see Cat. Derm. Salt. B.M. iii. p. 577. no. 1, *g.*), are quite indistinguishable from the typical *ægyptium*, except by the slightly more acute hind angle of the pronotum, which may be due to the previous preservation of the specimens in alcohol, and their supposed origin from South Africa seems to me very doubtful. I think, therefore, it is better to regard *indecisum* as a pure synonym of *ægyptium*, unless fresh and more reliable records as to the occurrence of this species in South Africa become available; in that case, and if the more angulated pronotum proves to be a distinctive feature of South African specimens, they will have to be regarded as a subspecies to which Walker's name should be applied.

As the species has been described and figured many times, there is no need to give a description. As regards the variability of its characters, I should like to mention that I have seen some specimens from Palestine in which the base of the wings is pale violaceous, as may be seen sometimes in *A. mæsta* and its subsp. *melanorhodon* (see below).

Geographical distribution. It is an essentially Mediterranean species, which ranges, as a permanent member of the fauna, not farther northwards than Bordeaux, the Alps, and the Crimea, while the most southern locality is Nubia (Karuy, Sitz. Akad. Wien, Bd. cxvi. Abt. 1, p. 307). In the west it is known from Madeira, while it ranges as far eastwards as Russian Turkestan and Baluchistan (Quetta; B.M.).

2 a. *Anacridium mæstum mæstum* (Serv.).

1839. *Acridium mæstum*, Serville, Ins. Orth. p. 654. no. 14.
 1910. *Orthacanthacris* *mæsta*, Kirby, Cat. p. 444. no. 1.
 **1907. *Orthacanthacris* *wernerella*, Karny, Sitz. Akad. Wiss. Wien, cxvi. Abt. 1, p. 305. no. 57.
 1918. *Orthacanthacris eximia*, Sjöstedt, Arkiv Zool. xii. no. 1, p. 2, fig. 2.

The characters given by Karny for separating his *wernerella* from *mæstum* are not of specific value, as may be easily seen in a sufficiently long series of specimens.

The base of the hind wings is sometimes rosy or violaceous.

Geographical distribution. This subspecies is distributed all over South Africa, ranging northwards up to North Uganda (Gondokoro) and Northern Nigeria (Zungeru, B.M.); it has, however, never been recorded from the forest-regions of Central and West Africa, and it seems that it does not penetrate there.

2 b. *Anacridium mæstum melanorhodon* (Walk.). (Fig. 6 c.)

- **1870. *Acridium melanorhodon*, Walker, Cat. iii. p. 585. no. 28.
 **1907. [*O. wernerella*], var. *sphalera*, Karny, Sitz. Akad. Wiss. Wien, cxvi. Abt. 1, p. 305.
 1907. *Acridium æthiopicum*, Finot, l. c. pp. 269, 346.

The characters separating this form from the typical *mæstum* are of such a kind that I cannot give them specific value, and the data concerning their distribution lead to the conclusion that they are but geographical races of the same species.

Geographical distribution. The race *melanorhodon*, originally described by Walker from St. Jago, Cape Verde Islands (not S. America, as incorrectly recorded by Walker), represents a northern form of *mæstum*. I have seen examples from St. Vincent, Cape Verde Islands; Khartum; Massowah; Aden and Sokotra; Karny described his *sphalera* from Renk, Sudan, and Finot's *æthiopica* was described from Abyssinia.

3. *Anacridium flavescens* (F.).

1793. [*Gryllus*] *flavescens*, Fabricius, Entom. Syst. ii. p. 52. no. 24.
 1910. *Orthacanthacris* *flavescens*, Kirby, Cat. p. 445. no. 10.
 **1870. *Acridium pardalinum*, Walker, Cat. iii. p. 587.

The identity of *pardalinum*, Walk., with *flavescens*, F., has been recorded already by Kirby in the 'The Fauna of British India' (Acrid. p. 225, 1914), and is beyond any doubt.

Geographical distribution. The only known localities where this species occurs are Tranquebar (Fabr. l. c.), Trichinopoly

(Finot, *l. c.*), Marudaimalai and Coimbatore (Bolivar, Rev. K. Acad. Cien. Madrid, xvi. nos. 6, 7, 8, 9, p. 401, 1918) in South India, and Ceylon (B.M.).

XII. Genus *ORTHACANTHACRIS*, Karsch.

1896. *Orthacanthacris*, Karsch, Stett. Ent. Ztg. lvii. p. 303.

This very peculiar genus has never been diagnosed properly, as its author simply mentioned in a note to the description of his *Cyrtacanthacris humilicrus* the principal differences between the latter and *ægyptia*, and expressed a suggestion that it belongs probably to a distinct genus which may be called *Orthacanthacris*. As, however, the genus is easily recognisable by the genotype, the name must be regarded as valid. The generic difference between *ægyptia* and its relatives, on the one hand, and *humilicrus*, on the other, are obvious and clearly indicated in my key to the genera (see Part I., p. 141).

Kirby's conception of the genus *Orthacanthacris* (Cat. p. 444; Fauna Brit. Ind., Acr. p. 224) is based not on the true generic characters, but merely on the name, and he included in it all the species of *Cyrtacanthacrini* with the straight prosternal spine; I have shown already that this character alone cannot be used for separating genera.

The genotype, *O. humilicrus*, seems to be the only known species of this genus, though it is not impossible that the insufficiently described *C. illustrissima*, Karsch (Stett. Ent. Ztg. lvii. p. 297. no. 60), also belongs here.

1. *Orthacanthacris humilicrus* (Karsch). (Fig. 7 d.)

1896. *Cyrtacanthacris humilicrus*, Karsch, Stett. Ent. Ztg. lvii. p. 301. no. 64, fig. 25.

1910. *O[orthacanthacris] humilicrus*, Kirby, Cat. p. 444. no. 5.

The dimensions of the male (Eritræa; M.M.), which was unknown to Karsch, are as follows: body 49; pronotum 10; elytra 63; hind femur 26 mm.

Geographical distribution. The species is known from the Slave Coast (Karsch, *l. c.*); Dakar, Senegal (P.M.); Ugogo, E. Africa (Karsch, *l. c.*), and Eritræa (M.M.)

XIII. Genus *WILLEMSEA*, nov.

Frontal ridge in profile somewhat reclinate, slightly convex; seen from the front it is very slightly dilated above the ocellum, narrowed again at the fastigium, as well as below the ocellum; its surface punctured, slightly impressed below the ocellum; the margins scarcely raised, almost

obliterate before reaching the clypeus. Fastigium of vertex strongly sloping and forming with the frontal ridge a broad curve; its surface flat, margins perfectly obliterate. Eyes oval, prominent, distinctly less than twice as high as long; subocular distance distinctly more than length of an eye, but less than its height; distance between the eyes less than the length of an eye, but distinctly broader than the frontal ridge between the antennæ. Pronotum rounded, somewhat compressed laterally, but scarcely constricted in the prozona; median keel very low, subobliterate by puncturation. Elytra as in *Valanga*. Hind femora short and fairly thick. Male cerci elongato-triangular, with the apex very slightly incurved. Wings infumate.

This is a very peculiar genus, which forms a sort of connecting-link between the *Acridoderi*, which it remotely resembles in the structure of the head, and the *Valanga*-group of genera, to which it is, no doubt, most closely related. It differs, however, so much from the true *Valanga* in the head, pronotum, and the type of coloration, that I do not hesitate to separate it generically. Only one species is known as yet.

1. *Willemsea bimaculata* (Willemse).

1922. *Orthacanthaeris bimaculata*, Willemse, Orthoptera in Nova Guinea, xiii., Zool. 5, p. 720, figs. 8, 9.

I have seen two specimens only, male and female, from Sattelberg, German New Guinea (M.M.).

[To be continued.]

XLVIII.—*Ursus anglicus*, a new Species of British Bear.

By ROBERT T. GUNTHER, F.L.S.

[Plates II. & III.]

A LOWER mandible of this bear was found with other bones about 5 feet below the surface in a pit in the Cherwell gravels, of Pleistocene age, that underlie the Deer Park of Magdalen College. A few of the bones showed scratchings, indicating that they had been rolled along the bed of a fast-flowing stream, but the greater number seem to have belonged to animals that died on the spot or at no great distance away. The bones were found below a well-marked band of recent fresh-water shells, and at about 2 ft. 6 in.